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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/894,225	06/27/2001	Aaftab A. Munshi	0269518 BEL-031	4829

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EXAMINER

SEALEY, LANCE W

ART UNIT	PAPER NUMBER
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2671

DATE MAILED: 11/18/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/894,225

Applicant(s)

MUNSHI, Aaftab A.

Examiner

Lance W. Sealey

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 09 August 2004.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 6-8, 15-17, 23, 27, 34, 38, 44 and 48 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 6-8, 15-17, 23, 27, 34, 38, 44 and 48 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

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DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

- (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.

Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6-8, 15-17, 23, 27, 34, 38, 44 and 48 are rejected under 35 U.S.C. 103(a) as being unpatentable by Foley et al., Computer Graphics: Principles and Practice Second Edition in C ("Foley") in view of Persistence of Vision Ray-Tracer ("POV-Ray").
3. Foley, in disclosing a simple recursive ray tracer, also discloses, with respect to claim 6, object visibility rules specifying a relationship between light sources and certain rays (not explicitly disclosed, but obvious to a person skilled in the art at the time the invention was made because the code calculating the closest intersection of a ray with an object is a calculation of whether an object is visible; see Fig.16.56, p.780), and looking up a rule associated with one of the light sources when processing the certain rays for the light source (section in Fig.16.56 marked "Compute shade at point on object, tracing rays for shadows, reflection and refraction", p.780. Any code doing a comparison during the implementation of ray tracing could be

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construed as “looking up a rule”).

4. However, Foley does not disclose ray tracing used for specific aspects of rendering; these elements are disclosed by the POV-Ray ray tracing software. POV-Ray discloses a graphics apparatus comprising a rendering system (2. Program Description) that renders an object in response to a graphics input (4.3.1 Box Object) including object visibility rules (Foley), wherein the rendering system includes a ray tracer (title)), the rendering system constraining the rendering of the object in accordance with the object visibility rules (when using the POV-Ray code to draw the box object in 4.3.1 Box Object, obvious to a person skilled in the art at the time the invention was made to include the Foley code for object visibility rules because rendering is quicker because the need is eliminated to directly calculate the intersection of objects—see p.704, second paragraph),

5. Therefore, it would have been obvious to one of ordinary skill in the art at the time this invention was made to incorporate the POV-Ray software in the Foley ray tracing algorithm. POV-Ray enables the other elements of rendering to be added to Foley’s calculations of intersections, shadows, reflection and refraction (POV-Ray, “2. Program Description”).

6. Concerning claims 7 and 16, Foley discloses certain rays including rays originating from the light source and potentially intersecting the object (Fig. 16.51, p.777).

7. Regarding claims 8 and 17, Foley discloses the ray tracer constructing a ray tree in accordance with the object visibility rules (Hierarchies, pp.706-707).

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8. Claim 15 is similar to claim 6 except it discloses a plug-in. However, POV-Ray is a plug-in to the operating system on which it runs (2.3 Which Version of POV-Ray should you use?)

9. With respect to claim 23, POV-Ray discloses a scene server that receives a graphics input specifying a plurality of objects (obvious to a person skilled in the art at the time the invention was made to disclose a scene server because 3.2 Basic Usage, second paragraph, discloses receiving a graphics input specifying a plurality of objects, and obvious to separate one process to run on its own server, like graphics input, because the Microsoft Computer Dictionary lists transaction management as a benefit to separating an application for processing on its own server), and Foley discloses extracting object visibility information from the graphics input (not explicitly disclosed, but obvious to a person skilled in the art at the time the invention was made because the code calculating the closest intersection of a ray with an object is a calculation of whether an object is visible; see Fig.16.56, p.780), a ray tracer coupled to the scene server that determines intersections of rays with certain of the plurality of objects included in the scene (Fig.16.56, p.780), the ray tracer receiving the object visibility information and constraining the ray intersection determination in accordance therewith (Fig.16.56, p.780), and constructing ray trees associated with the certain objects and the intersections, the ray tracer constraining objects to be included in the ray trees in accordance with the object visibility rules (Hierarchies, pp.706-707).

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10. Concerning claims 27, 38 and 48, Foley discloses a shader coupled to the ray-tracer for determining colors associated with the ray trees (incorporate the Hierarchies code on pp.706-707 with Fig.16.56 on p.780).

11. Claim 34 is essentially the same as claim 23 except that claim 23 discloses a scene server and claim 34 discloses a graphics apparatus. It is at least obvious that a scene server is a graphics apparatus.

12. Claim 44 is essentially the same as claim 23 except that claim 23 discloses a scene server and claim 44 discloses a graphics method. It is at least obvious that claim 23 discloses a graphics method.

13. Accordingly, in view of the foregoing, claims 6-8, 15-17, 23, 27, 34, 38, 44 and 48 are rejected as being unpatentable under 35 U.S.C. 103(a) by Foley in view of POV-Ray.

Response to Remarks

14. The applicant first asserts that neither Foley nor POV-Ray disclose the claim 6 limitation, "constraining the rendering of the object in accordance with the object visibility rules," then explain what is meant by this limitation in their specification.

15. Unfortunately for the applicant, although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Genus*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

16. The limitation "constraining the rendering of the object in accordance with the object

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visibility rules” is very broad. Foley, in describing code calculating the visibility of an object by calculating the closest intersection of a ray with an object, discloses “object visibility rules.”

POV-Ray “constrains rendering of an object” by limiting rendering to a box object. It would have been obvious to constrain the object “in accordance with” the object visibility rules because the POV-Ray rendering is quicker when the Foley method of eliminating the need to directly calculate the intersection of objects is employed. Therefore, while the combination of Foley and POV-Ray may not disclose what is disclosed in the applicant’s specification, it does disclose what the applicant has claimed. Therefore the rejections of claim 6, 8, 15 and 17, and the claims that depend from these claims, still stand.

17. The applicant's other assertion is that Foley and POV-Ray do not teach or suggest the element in claim 23, “a ray tracer coupled to the scene server that determines intersection of rays with certain of the plurality of the objects included in a scene, the ray tracer receiving the object visibility information and constraining the ray intersection in accordance therewith” because “the techniques disclosed in these references do not constrain ray intersection determination in accordance with object visibility determination as discussed above.” Since the examiner has discussed in items 4, 5 and 16 above how the techniques of Foley and POV-Ray constrain ray intersection determination in accordance with object visibility determination, the rejections of claims 23, 34 and 44, and the claims that depend from these claims, still stand.

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18. Therefore, **THIS ACTION IS MADE FINAL**. See MPEP 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

19. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lance Sealey whose telephone number is (703) 305-0026. The examiner can normally be reached Monday-Friday from 7:00 am to 3:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mark Zimmerman, can be reached on (703) 305-9798. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9314.

Any response to this action should be mailed to:

MS AF

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Commissioner for Patents

P.O. Box 1450

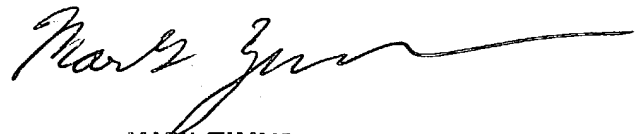
Alexandria, VA 22313-1450

or faxed to:

(703) 872-9306

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal Drive,
Arlington, VA, Sixth Floor (Receptionist).

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



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